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ABSTRACT

To study the effects of college tuition discounting, data from annual Institutional Student Aid Surveys of private colleges and universities were compared to enrollment and Pell Grant data from the U.S. Department of Education. Findings indicated that: (1) at least one quarter of the colleges and universities used discounting strategies that resulted in large losses of tuition revenue; (2) institutions with the greatest increases in discount rates raised their spending on institutional grants by $3,375 per undergraduate, but their tuition and fee revenue grew by just $3,069; (3) discounting strategies do not appear to have significantly improved the academic profiles of admitted undergraduates when measured by changes in median admissions test scores of entering first-year students; (4) tuition discounting does appear to have helped institutions increase their numbers of low-income undergraduates; and (5) the increased use of tuition discounting does appear to have made it possible for more students from all income levels to enter higher education. (Contains 42 references.) (EV)

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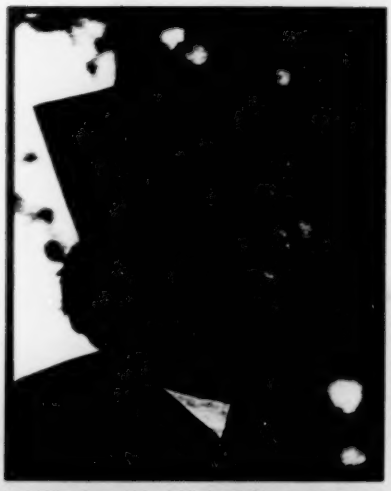

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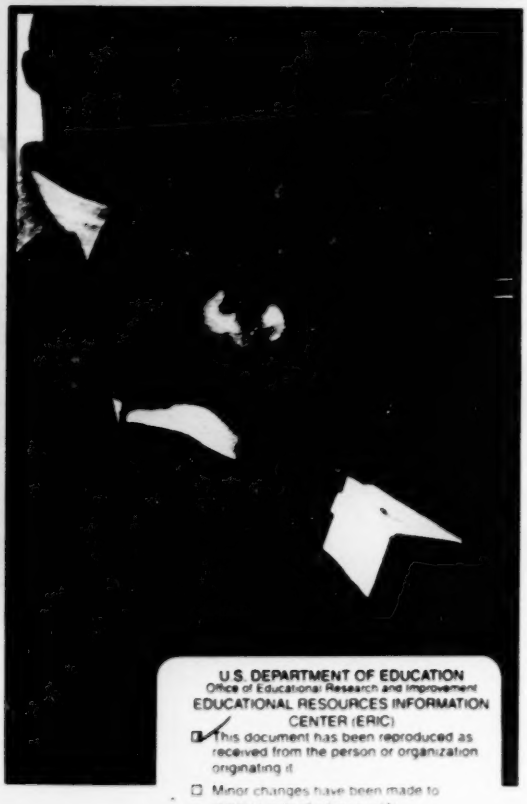

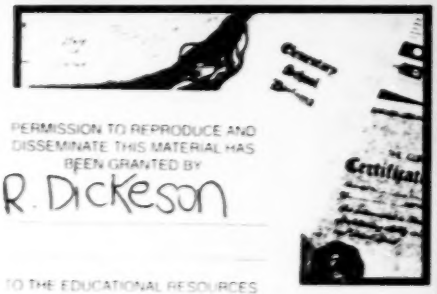

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Discounting Toward Disaster:

Tuition Discounting, College Finances, and Enrollments of Low-Income Undergraduates

Kenneth E. Redd, USA Group Foundation

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December 2000

Discounting Toward Disaster: Tuition Discounting, College Finances, and Enrollments of Low-Income Undergraduates

by Kenneth E. Redd
USA Group Foundation

Executive Summary

During the 1990s, many four-year private colleges and universities turned to the practice of tuition discounting to meet their enrollment and revenue goals. Under tuition discounting plans, colleges provide institutionally-funded grants to undergraduates to help them pay all or a portion of their tuition and fee charges to attend their higher education institutions.

olleges and universities have several distinct (and sometimes conflicting) goals for using tuition discounts: to increase enrollments of low-income and other under-represented students; to raise enrollments of students with high academic achievements or other talents; and to increase revenue from tuition and fees. The discounts may be awarded to students based on their demonstrated financial need, or may be based on students' academic merit or other criteria established by the institutions. Campus administrators hope that tuition discounts can attract more of the "best and brightest" undergraduates to their campuses. Thus, discounting is seen as a way to help institutions raise their academic "profiles" and ranking in college guidebooks.

■ **Discounting is a major departure from past uses of institutional grant aid.** In prior years, institutional grants were awarded primarily on the basis of students' demonstrated financial need, which was based on formulas and methodologies used by financial aid administrators at colleges and universities. Increasing enrollments or providing scholarships for the "best and brightest" students was not a major consideration. However, under tuition discounting, campus administrators use a portion of their grant dollars to fund academic merit scholarships and other "non-need-based" grants to attract meritorious students. Financial need is not a key criterion for merit-based grants.

and competition among colleges and universities for high-ability students is often fierce. Thus, tuition discount dollars are sometimes provided to the students even if they and their parents could pay the full cost of tuition and fees.

■ **Increasingly, higher education analysts have become concerned with the growing use of tuition discounting.** Between academic year 1989-90 and 1995-96, institutional grants to students attending four-year private institutions jumped by nearly 70 percent in inflation-adjusted value, from $3.7 billion to $6.2 billion. Many analysts believe that, as a result of discounting, more of these dollars have gone to students from higher-income families. In the 1989-90 to 1995-96 period, institutional need-based grants to undergraduates from higher-income families grew by 79 percent, while the number of recipients from low-income families rose by just 1 percent. The number of academic merit scholarships and other "non-need-based" grants to middle- and upper-income students grew by 23 percent, but the number awarded to low-income undergraduates fell by 11 percent.

■ **Use of tuition discounting thus brings many questions:** Has the increasing use of tuition discounting helped to raise tuition revenue at private colleges and universities? What effect has discounting had on enrollments of low-income students, particularly at private colleges and universities with selective and highly selective admissions criteria? Has the use of discounting increased the academic "profile" of admitted and enrolled students, as measured by admission test scores? This study used data from the National Association of College and University Business Officers' (NACUBO) Institutional Student Aid Survey and the U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS) to answer these questions.

At least one quarter of the four-year private colleges and universities used discounting strategies that resulted in large losses of tuition revenue.

The databases were used to examine changes in tuition discount rates (the percentage of tuition and fee revenue used to provide institutional grants to undergraduates), tuition and fee revenue, total undergraduate enrollment, and enrollment of low-income undergraduates from 1990-91 to 1996-97. The results show that at least one quarter of the four-year private colleges and universities used discounting strategies that resulted in large losses of tuition revenue.

■ **During the study period, the institutions with the greatest increases in discount rates raised their spending on institutional grants by $3,375 per full-time equivalent (FTE) undergraduate, but their tuition and fee revenue grew by just $3,069.** Thus, these institutions lost at least $306 per FTE in net tuition revenue as a result of their increases in spending on tuition discounting. Some highly selective and selective institutions lost more than $800 per FTE in tuition revenue. Due to the large losses in revenue, these institutions had smaller increases in the funds they devoted to academic instruction and other educational services to students, and had declines in spending on maintenance of campus buildings and other facilities. The institutions with the largest increases in spending on tuition discounting also saw their total undergraduate enrollments decline by 5 percent and had lower six-year graduation rates. These results occurred because discounting strategies are often focused more on increasing enrollments of first-year students than on retaining students toward graduation.

■ **Discounting strategies also do not appear to have significantly affected the academic "profiles" of admitted undergraduates, when measured by changes in median admissions test scores of entering first-year students.** Data from the College Board show that the median composite Scholastic Aptitude Test (SAT) scores of first-year

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undergraduates who entered college from 1990-91 to 1997-98 grew by less than 3 percent at institutions with the largest increases in tuition discount rates. In the same period, the scores of freshmen who enrolled at institutions with the smallest increases in discounting grew by 10 percent. Among colleges and universities with less-selective admissions criteria, median SAT scores fell by 2 percent at institutions with the largest increase in tuition discount rates.

■ **However, tuition discounting does appear to have helped institutions to increase their numbers of low-income undergraduates.** The number of students who received Federal Pell Grants (grant aid targeted toward students with the greatest financial need) grew by 20 percent at institutions with the largest increases in discount rates, and by 16 percent at colleges and universities with the smallest increases in discounting. These results suggest that tuition discounting was more successful at helping institutions achieve their goals of providing greater access to higher education for low-income students than at attracting more academically-talented freshmen.

■ **The increased use of tuition discounting does appear to have made it possible for more students from all income levels to enter higher education.** Unfortunately, at least one quarter of the private colleges and universities paid a steep price for this achievement. The rapid use of tuition discounting led to large losses in net tuition revenue and have resulted in decreased spending on instruction and other services to students. Four-year private colleges and universities should improve their retention programs and other programs for undergraduates before even more institutions follow this precarious financial path.

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Introduction: What is Tuition Discounting?

uring the 1990s, funds provided for student financial assistance became the fastest-growing expenditure item for most four-year private colleges and universities. Between academic year 1989-90 and 1995-96, grant aid to students from private institutions jumped by nearly 70 percent in inflation-adjusted value,[1] from $3.7 billion to more than $6.2 billion. By comparison, funds provided for academic instruction and student services rose by just 9 percent; research expenditures increased by 14 percent; and amounts devoted to maintenance of campus buildings and other facilities fell by 1 percent (Reindl and Redd 1999).

Institutional aid increased in part because the amounts provided by the federal government for Pell Grants and other grant-based assistance to low- and moderate-income undergraduates fell by nearly 6 percent, while tuition and fee charges at four-year private colleges and universities increased by 16 percent (College Board 1999a and 1999b). In 1989-90, the maximum Pell Grant award covered 19 percent of the average price of tuition, fees, room, and board at four-year private institutions. By 1995-96, the maximum Pell Grant paid for only 13 percent of these charges (College Board 1999a). In more recent years, increases in federal Pell Grant appropriations have given more grant funds to low-income students, but these increases have not kept pace with rising college tuition and other charges. Consequently, many private colleges have had to increase grant assistance from their own resources in order to provide educational opportunities to low-income undergraduates.

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At the same time, many private institutions felt compelled to increase grant aid not only to low-income undergraduates, but also to middle- and upper-income students. Congressional panelists, in their recent study of rising college expenses (National Commission on the Cost of Higher Education 1998), expressed concern that college was becoming unaffordable for many students from higher-income families. Due to changes in the formulas used to determine eligibility for financial aid, more students from middle- and upper-income families became eligible to receive assistance. Since relatively fewer federal grant dollars were available for these students, institutions became the primary source of grant aid for them.

Many higher education analysts also became concerned about the amounts of federal student-loan debt middle- and upper-income students incurred to receive bachelor's degrees. One study (King 1999) showed that borrowing by students from higher-income families more than tripled from 1992-93 to 1995-96. As a result, cumulative federal student-loan debt for students from families with income of $60,000 to $79,999 grew by 43 percent, and debt for students from families with income of $80,000 or more rose by 50 percent (Redd 1999). Higher education institutions — particularly private colleges and universities — increasingly felt pressured to provide more grant aid in order to lower students' loan-debt burdens.

Further complicating matters for private institutions was the increased competition for students that occurred throughout the past decade. The number of high school graduates

[1] Inflation adjusted values are based on the Higher Education Price Index. See Research Associates of Washington 1999.

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(who usually make up the majority of traditional-age college-bound students) increased by only 3 percent from 1990-91 to 1996-97 (Western Interstate Commission for Higher Education 1998). The relatively low increase in the number of high school graduates made the competition among institutions to meet their enrollment goals for each entering class extremely high and may have encouraged institutions to increase their amounts of institutional aid to convince prospective students to enroll. The number of high school graduates is expected to increase by 7 percent during the next decade, but many of these new graduates will come from racial/ethnic minority populations and other groups that traditionally have been underrepresented in postsecondary education. For example, from academic year 2000-2001 to 2011-2012, the number of Latino high school graduates is expected to jump by 83 percent, while the number of African American graduates may rise by 10 percent (Western Interstate Commission for Higher Education 1998). Since many of these students will need increasing amounts of grant aid if they hope to attend high-cost postsecondary education institutions, the pressure on colleges and universities to award larger amounts of grant dollars to undergraduates will continue for the foreseeable future.

In addition, competition among colleges for students with high academic ability is particularly fierce. Methodologies used by *U.S. News and World Report* and other organizations to rank colleges and universities usually place a high emphasis on the proportion of entering first-year students with high college-admissions test scores and other demonstrated abilities (Morse and Flanigan 2000). Accordingly, many four-year private institutions have begun to use more of their institutional aid dollars to entice the "best and brightest" students to enroll on their campuses (McPherson and Schapiro 1998; Winston and Zimmerman 2000; Lapovsky and Hubbell 2000).

Faced with these forces (i.e., rising tuition prices and student loan indebtedness, increasing pressure to award more aid to higher-income students, and rising competition for academically gifted undergraduates) many four-year private colleges and universities have turned to the practice of *tuition discounting* to award their institutional grant aid. Under tuition discounting plans, colleges use their institutional grants to reduce the tuition and fee charges students would otherwise be unable or *unwilling* to pay to attend particular higher education institutions. The discounts may be funded by tuition and fee revenue (the collective amounts of tuition and fees students and their families pay to attend postsecondary education institutions), donations from alumni or other private sources, and earnings from endowments. Discounts also may be unfunded tuition waivers, with which colleges and universities simply forgo all or part of the total tuition and fee charge that students otherwise would have had to pay to attend their institutions (Allen 1999).

Under tuition discounting strategies, colleges and universities hope to use their institutional grant dollars to encourage a greater number of students to enroll at their campuses. Under these schemes, institutional grant recipients and amounts are based on students' demonstrated financial need, the students' admissions test scores or other documented talents and abilities, and other factors colleges may use to determine eligibility. Four-year private colleges and universities use tuition discounting for two distinct purposes:

- *To enhance campus diversity efforts* — Institutions use a portion of their institutional aid to encourage students from low-income families, racial/ethnic minorities, and other underrepresented group members to enroll on their

Under tuition discounting plans, colleges use their institutional grants to reduce the tuition and fee charges students would otherwise be unable or unwilling to pay to attend.

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— ***Just as business owners discount the prices of their products to encourage more customers to visit their stores, college administrators hope that discounting will lead to increases in enrollment and additional revenue.***

campuses. These discounts usually are awarded based on students' demonstrated financial need, calculated when students apply for financial aid at colleges and universities. Institutional aid provided for these purposes helps institutions meet their *educational equity goals*, since the colleges and universities seek to provide equal educational opportunities to students from low-income families and other underrepresented groups (Baum 2000; Reindl and Redd 1999).

- *To improve marketing and enrollment management strategies* — An increasing number of colleges and universities use their institutional aid funds to encourage students with high academic achievement or other talents to attend their institutions. Aid awarded for these efforts is also referred to as "non-need-based" grants since, in many cases, students' financial need is not a criterion for distributing these dollars. Institutions that provide non-need-based aid hope to enhance their *enrollment management* goals. Such goals vary; some colleges and universities simply want to increase total enrollments, while others want to raise their enrollments of students with particular abilities or talents (for example, students with admissions test scores above a certain level). Many institutions target institutional grants for these purposes to prospective first-year students (Baum 2000; Reindl and Redd 1999).

These two goals need not be mutually exclusive; colleges sometimes seek to enroll students who have both demonstrated financial need *and* high academic ability or other talents. But both goals have important effects on institutions' decisions to distribute institutional aid. In order to meet educational equity goals, colleges and universities must give more grants to low- and moderate-income students whose families could not afford to pay the full the tuition price. At the same time, institutions may need to give more aid to meritorious students, since these students may raise the "profile" of the institutions in the eyes of the general public and college ranking organizations. For example, institutions that are able to enroll a class of students with higher admissions test scores might publicize this fact in guide books and other places, and thus may convince similar prospective students who otherwise might not have applied to their institutions to come to their campuses.

Simultaneously, campus administrators also hope that providing large institutional grants to more students will, in the long run, bring more revenue to their colleges and universities. Many administrators believe that providing the discounts to students who pay part of the tuition and fees is better than having empty classroom and dormitory space, which generates no new revenue (McPherson and Schapiro 1998). Institutional grant dollars, if spent strategically and wisely, can help increase revenue from tuition and fees, and might raise total enrollments to levels above what they would have been had no aid been provided (McPherson and Schapiro 1998; Baum 2000). Just as business owners discount the prices of their products to encourage more customers to visit their stores, college administrators hope that discounting will lead to increases in enrollment and additional revenue. These administrators hope that increases in grant aid, in combination with other factors (such as campus location and climate, academic reputation, etc.) will encourage more students to choose their institutions. As tuition and fee prices increase, the administrators assume that, *all else being equal*, students and their families will choose the college or university that offers the lowest out-of-pocket cost or largest amount of institutional grants (Winston and Zimmerman 2000).

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Ultimately, the institutions hope that the amounts they provide for tuition discounts are large enough that more students will choose to enroll, but not so large that they result in a loss of tuition and fee revenue. To meet these enrollment and revenue objectives, colleges and universities seek to set an appropriate *tuition discount rate*. This rate is based on the percentage of tuition and fee revenue used to cover institutional grant aid. This percentage is calculated by dividing *gross* tuition and fee revenue (revenue before the value of tuition discounts is subtracted) by the amounts of funded and unfunded tuition discounts. Tuition revenue is used as the basis of comparison because it is the largest source of funds for most private colleges and universities. In 1995-96, revenue from tuition and fees accounted for 55 percent of the educational and general funds (dollars used to finance academic, research, and other education-related expenditures at postsecondary education institutions) at four-year private colleges and universities (U.S. Department of Education 1998a). The endowments at many private institutions generate only a small amount of income — according to the U.S. Department of Education (1998a), the median amount of income earned by endowments at four-year private colleges and universities in 1995-96 was only $462 per full-time equivalent undergraduate. Consequently, dollars from tuition and fees also serve as the primary source of funds used for institutional grants. As discount rates increase, institutions run the risk of having fewer dollars available for instruction, libraries, faculty and administrators' salaries, and other academically related expenses. From 1989-90 to 1995-96, the tuition discount rate at all private colleges and universities rose from 17 percent to 22 percent (U.S. Department of Education 1990a and 1998a).

Tuition discounting is a stark reversal from the traditional uses of institution-based financial aid. In the past, it was expected that colleges and universities would use most of their grant aid for financially needy students. Postsecondary education institutions used complex formulas to determine which students were eligible for awards and how much they would receive (Russo 2000, McPherson and Schapiro 1998). This tradition meant that the majority of the aid dollars were distributed to students from low- and moderate-income families. However, more recent trends indicate that discounting has led to a shift of institutional aid toward undergraduates from middle- and upper-income families. Heller and Nelson Laird (1999) discovered that, during the 1990s, the number of need-based institutional grants provided to undergraduates from higher-income families grew by 79 percent, while the number of recipients from low-income families rose by just 1 percent. Even more troubling for many higher education analysts is the increasing share of institutional grant dollars provided to upper-income undergraduates for academic merit scholarships and other "non-need-based" purposes. The number of undergraduates from higher-income families who were awarded non-need-based institutional grants jumped by 23 percent from 1989-90 to 1995-96, but the number provided to low-income undergraduates fell by 11 percent (Heller and Nelson Laird 1999).

Awarding tuition discounts thus brings many potential conflicts for colleges and universities. Institutions that increase their amounts of non-need-based aid risk losing their ability to enroll more lower-income students because students who meet the non-need criteria are more likely to come from middle- and upper-income families (Baum 2000; Heller and Nelson Laird 1999). At the same time, targeting more aid on low-income students might lead to a loss of tuition dollars because these undergraduates usually require larger discounts than do students from middle- and upper-income families. And

As discount rates increase, institutions run the risk of having fewer dollars available for instruction, libraries, faculty and administrators salaries, and other academically related expenses.

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providing large discounts to any number of students, regardless of the purposes, might lead to a loss of revenue for a number of institutions, particularly small liberal arts colleges that do not have large endowments or other resources that can be used to bear the costs of increasing grant aid (Breneman 1994; Winston and Zimmerman 2000).

The increasing use of tuition discounting has raised several questions.

The increasing use of tuition discounting has raised several questions that will be addressed in this study: Has the increasing use of tuition discounting helped to raise tuition revenue at private colleges and universities? What effect has discounting had on enrollments of low-income students, particularly at private colleges and universities with selective and highly selective admissions criteria? Has the use of discounting increased the academic "profile" of admitted and enrolled students, as measured by admission test scores? Answers to these questions have great implications for private institutions' ability to increase funding for academic services and other education-related operations, and to provide access for low-income and other underrepresented groups. However, before addressing these issues, more information is provided on the study methodology and on the issues involving tuition discounting.

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Study Methodology

o study the effects of tuition discounting, the USA Group Foundation obtained a database of 275 four-year private colleges and universities that responded to the Institutional Student Aid Survey sponsored by the National Association of College and University Business Officers (NACUBO 2000). These institutions responded annually to the NACUBO survey from 1990-91 to 1998-99. The database serves as a sample of the 1,463 accredited four-year private colleges and universities in the United States during the 1990s (Reindl and Redd 1999).

The NACUBO data provide the most up-to-date information available on institutional grants provided by four-year private institutions. The NACUBO data include grants provided to undergraduates exclusively. These grants were funded by both tuition and fee revenue and earnings from endowments. The grant figures also include unfunded tuition waivers. The NACUBO database also provides information on the colleges and universities' annual tuition and fee charges, numbers of first-time, full-time freshmen, and numbers of freshmen who received institutional grants.

The database serves as a sample of the 1,463 accredited four-year private colleges and universities in the United States during the 1990s.

The NACUBO data were matched with information from the U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS) fall enrollment surveys (U.S. Department of Education 1990b and 1997a) in order to compare the changes in tuition discounting with the changes in total undergraduate enrollments. The most recent IPEDS enrollment data are for fall 1997 (the beginning of the 1997-98 academic year). It is likely that it would take up to one year for changes in institutions' tuition discounting policies to influence prospective students' enrollment decisions. For this reason, the NACUBO data for 1990-91 to 1996-97 were used to show what effects discounting may have had on enrollments in 1997-98. Nine institutions with missing IPEDS enrollment data were excluded from the study.

Data for low-income students are based on the number of undergraduates who received Federal Pell Grants in 1990-91 and 1997-98 (U.S. Department of Education 1991a and 1998b). The Pell Grant program provides funds to undergraduates from low-income families who demonstrate great need for financial assistance to attend postsecondary education. The maximum award for all students was $3,125 in academic year 1999-2000 (U.S. Department of Education 2000). In 1995-96, nearly 88 percent of the Pell Grant recipients who attended four-year private colleges and universities came from families with less than $30,000 in adjusted gross income (U.S. Department of Education 1999). Changes in the number of Pell Grant awardees at private institutions thus serve as a useful indicator of trends in the enrollments of students from low-income families.

Changes in the use of tuition discounting may differ because of the criteria used by colleges and universities to admit undergraduate students. Large universities with strict admissions standards would probably award aid in a much different manner than would small liberal arts colleges with less restrictive admissions methodologies (Winston and Zimmerman 2000). For this reason, the colleges and universities in the database were divided into levels of undergraduate admissions selectivity, based on definitions established by the *Peterson's Guide to Four-Year Colleges* (Peterson's 1998).[2] Based on the *Peterson's* criteria, the institutions were put into three selectivity groups:

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The results for the NACUBO sample are similar to those for the private colleges and universities in the IPEDS database.

- *Highly selective* — colleges and universities that offer admission to 30 percent or less or their applicants. Just 19 institutions (or about 7 percent) meet this definition.

- *Selective* — institutions that offer admission to up to 60 percent of their applicants. Forty-eight colleges and universities (or 18 percent) meet this standard.

- *Less-than-selective* — colleges and universities that provide admissions offers to 60 percent or more of their prospective students. There were 193 institutions (73 percent) in this group.

Selectivity data were missing for six of the institutions.

Unfortunately, when compared with the total number of four-year private colleges and universities in the United States, selective and highly selective institutions are over-represented in the NACUBO dataset. While one quarter of the institutions in the NACUBO database were considered selective or highly selective, just 11 percent of all four-year private schools met this standard (Reindl and Redd 1999). For this reason, the results generated for the NACUBO sample were compared with the results for all private colleges and universities, based on responses to the IPEDS finance surveys for 1989-90 and 1995-96 (U.S. Department of Education 1990a and 1998a). Later sections of the study will show that the results for the NACUBO sample are similar to those for the private colleges and universities in the IPEDS database.

[2] It was assumed that an institution's selectivity level remained constant throughout the study period.

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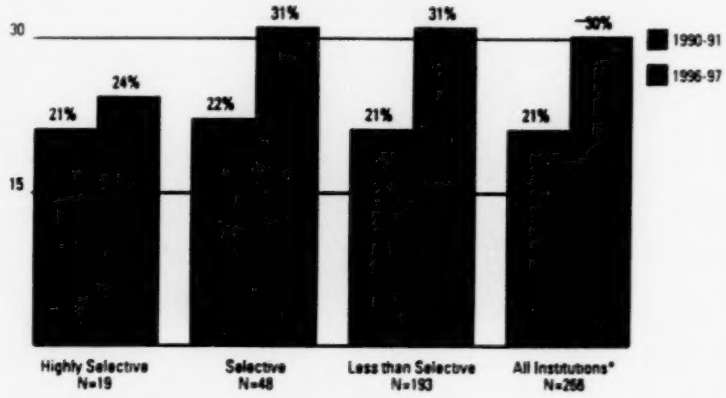
ue to the factors previously cited, tuition discount rates increased rapidly at all admissions selectivity levels, particularly at selective and less-than-selective institutions. Between 1990-91 and 1996-97, the average discount rate at less selective colleges and universities jumped from 21 percent to 31 percent. At selective institutions, the average rate climbed from 22 percent to 31 percent (see Figure 1).

In just six years, the average discount rate for all institutions rose by 9 percentage points, from 21 percent to 30 percent. But this increase masks some very wide variances in discount rate changes among the institutions. Colleges and universities in the top quartile of the distribution of discount rates changes — those with "above-average" increases in discounting — saw their tuition discount rates jump by 13.1 percentage points or more. Those in the bottom quartile — institutions with "below-average" increases in discount rates — saw their rates change by just 2.5 points or less. Colleges and universities with "average" increases in discount rates had growth rates of between 2.5 and 13.1 percentage points. Among selective and highly selective colleges and universities, "above-average" institutions increased their discount rates by 10.9 percentage points or more; "below-average" institutions changed their rates by 2.1 points or less; and "average" increases occurred between 2.1 and 10.9 points. For less selective colleges and universities, "above-average" discount rates grew by 13.6 percentage points or more; "average" institutions had rate changes of between 2.6 and 13.6 points; and "below-average" institutions had rates that changed by 2.6 points or less.

Figure 1. Tuition Discount Rates at Four-Year Private Colleges and Universities, by Undergraduate Admissions Selectivity Level, 1990-91 and 1996-97



* Includes institutions whose selectivity levels were missing.

Source: National Association of College and University Business Officers 2000; Petersons 1998.

Discount rates grew rapidly because the amounts provided for institutional grants grew at substantially higher rates than tuition and fee revenue. Figure 2 (on the next page) displays the changes in tuition and fee revenue, tuition prices, and institutional grant spending during the study period. Gross tuition and fee revenue at selective colleges and universities increased by 22 percent (adjusted for inflation) per full-time equivalent (FTE) undergraduate student, but institutional grant spending per FTE jumped by 74 percent. At less selective schools, grant aid nearly doubled, but revenue grew by just 32 percent. These findings suggest that *net* tuition and fee revenue (gross revenue minus institutional aid expenditures) declined by large amounts at many institutions.

Spending on tuition discounts also increased at a much higher rate than did tuition and fee prices set by colleges and universities. Tuition prices at private colleges and

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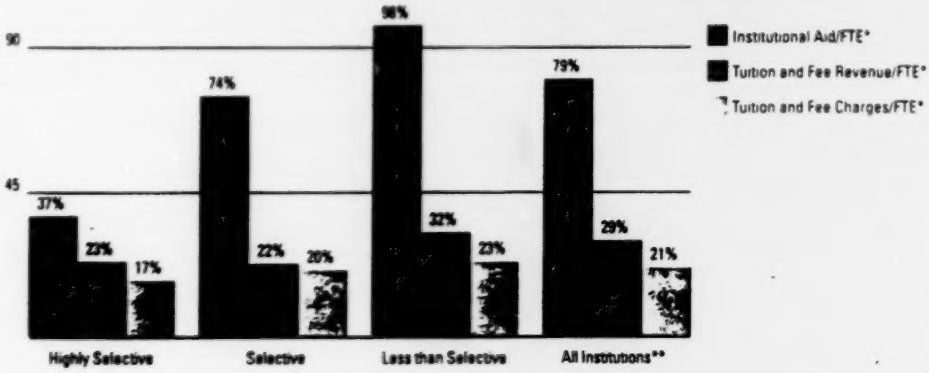
universities rose by 21 percent in inflation-adjusted value during the study period, but the rate of increase varied by selectivity level. When adjusted for inflation and weighted by full-time equivalent enrollment, tuition and fee charges grew by 17 percent at highly selective institutions, 20 percent at selective schools, and 23 percent at less-than-selective colleges (see Table 1).[1]

The large difference in growth rates between institutional grants and tuition prices effectively means that many undergraduates were paying much less than the increases in listed tuition "sticker prices" to attend four-year private colleges and universities. The difference between the listed tuition charges and the amounts students and families actually paid is better understood by comparing the growth in average tuition charges with average institutional grants on a per-dollar basis. From 1990-91 to 1996-97, the average tuition and fee price at private colleges and universities increased by $2,684, from $12,526 to $15,210, while average institutional grants grew by $1,835, from $2,313 to $4,148. Using a per-dollar basis to compare these two figures reveals that for every dollar the institutions increased their prices, they provided, on average, *68 cents in tuition discounts for each FTE undergraduate student.* The typical undergraduate and her family actually paid only 32 cents of each dollar of tuition increase. At selective institutions, tuition discounts essentially covered 70 cents of each dollar of tuition price increase; at less selective institutions, discounts paid for 74 cents of each dollar of tuition increase. Understanding the difference between the listed tuition prices and the amounts actually paid by undergraduates is important because many policy makers and college students have become concerned about increases in tuition and fee prices at all postsecondary education institutions (National Commission on the Cost of Higher Education 1998). Ironically, these concerns grew despite the fact that many private colleges and universities raised their own grant spending to cover the majority of these price increases for many students.

Figure 2. Percentage Change in Institutional Aid Compared With Change in Tuition and Fee Revenue and Tuition and Fee Charges, 1990-91 to 1996-97, at Four-Year Private Colleges and Universities



*Institutional grants, tuition and fee revenue, and tuition and fee charges are divided by full-time equivalent (FTE) undergraduate enrollments in Fall 1990 and Fall 1996.
**Includes institutions whose selectivity levels were missing.

Source: National Association of College and University Business Officers 2000; Peterson's 1998.

[1] Tuition and fee prices grew by 15 percent at all four-year private colleges and universities. See College Board 1999b.

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Table 1. Tuition and Fee Charges and Institutional Grants at Four-Year Private Colleges and Universities, by Undergraduate Admissions Selectivity Level, 1990-91 and 1996-97

	Average Tuition and Fee Charges in 1990-91*	Average Tuition and Fee Charges in 1996-97*	Percentage Change	Institutional Grants Per FTE Undergraduate in 1990-91	Institutional Grants Per FTE Undergraduate in 1996-97	Percentage Change	Percentage of the Increase in Tuition and Fees Covered by the Increase in Grants
Highly Selective	$17,414	$20,444	17.4%	$3,442	$4,724	37.2%	42.3%
Selective	15,702	18,862	20.1%	3,020	5,247	73.7%	70.5%
Less than Selective	10,676	3,133	23.0%	1,902	3,721	95.6%	74.0%
All Institutions**	$12,526	$15,210	21.4%	$2,313	$4,148	79.3%	68.4%

*Tuition and fee charges for 1990-91 are in 1996-97 dollars. The tuition charges for 1990-91 and 1996-97 are weighted by full-time equivalent (FTE) undergraduate enrollment.
**Includes institutions whose selectivity levels were missing.

Sources National Association of College and University Business Officers 2000; Research Associates of Washington 1999.

Much of the added grant spending by private colleges and universities appears to have been directed toward attracting new first-year students. As Table 2 illustrates, the proportion of first-time, full-time freshmen who received grants at four-year private institutions grew from about 64 percent in 1990 to 76 percent in 1996. The largest increase occurred at less selective institutions, where in just six years the proportion of

Table 2. Percentage of First-Year Undergraduates Who Received Institutional Grants and Average Grant Awards, 1990-91 and 1996-97

	Percent of Freshmen Who Received Institutional Grants in 1990-91	Percent of Freshmen Who Received Institutional Grants in 1996-97	Average Grants to Freshmen in 1990-91**	Average Grants to Freshmen in 1996-97	Percentage Change in Average Grants
Highly Selective	42%	45%	$10,307	$12,114	17.5%
Selective	51%	64%	8,997	10,444	16.1%
Less than Selective	69%	83%	4,353	5,733	31.7%
All Institutions*	64%	76%	$ 5,612	$ 7,022	25.1%

*Includes institutions whose selectivity levels were missing.
**In 1996-97 dollars.

Source: National Association of College and University Business Officers 2000; Research Associates of Washington 1999.

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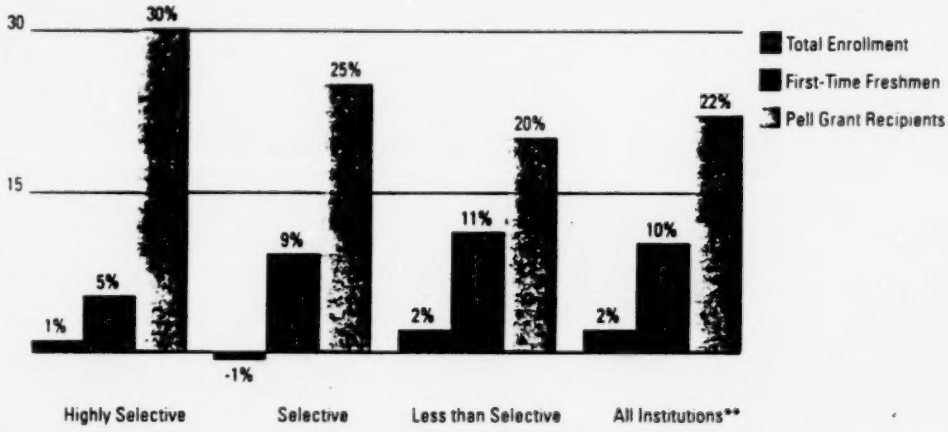
aided freshmen jumped from 69 percent to 83 percent. Conversely, highly selective colleges and universities saw just a 3-percentage point gain, from 42 percent to 45 percent.

Average institutional grants to first-year students also rose substantially. Less selective institutions increased their average grant award to first-year students by 32 percent in inflation-adjusted value, from $4,354 to $5,722, while grants to those at highly selective colleges rose by 17 percent, from $10,307 to $12,114. Colleges and universities with the greatest increases in discount rates also had the largest growth in institutional grants to freshmen. Average institutional grants to first-year undergraduates at colleges and universities with above-average growth in discount rates jumped by 52 percent. Average grants to freshmen at institutions with below-average and average rates of change in discount rates grew by just 21 percent and 28 percent, respectively. Despite these large increases, many colleges and universities apparently struggled to meet their enrollment management goals. Wolff and Bryant (1999) report that the average yield rates (percentage of admitted students who actually enrolled) at private colleges and universities actually fell from 44 percent in 1995 to 38 percent in 1997.

Figure 3. Percentage Change in Undergraduate Enrollments and Pell Grant Recipients* at Four-Year Private Colleges and Universities, by Undergraduate Admissions Selectivity Level, 1990-91 and 1997-98



*Pell Grant, total enrollment, and first-time freshmen enrollment data are for 1990-91 to 1997-98. Study assumes a one-year lag period between changes in discount rates and changes in enrollments and Pell Grant recipients.
**Includes institutions whose selectivity levels were missing.

Source: National Association of College and University Business Officers 2000; Peterson's 1998; U.S. Department of Education 1990b, 1991a, 1997a, and 1998b.

The additional grant aid to freshmen helped to increase the number of first-year undergraduates at all selectivity levels, but total undergraduate enrollments at most institutions were essentially flat, as Figure 3 demonstrates. Between 1990-91 and 1997-98, the total number of first-time, full-time freshmen at four-year private colleges and universities grew by 10 percent, but total undergraduate enrollment increased by just 2 percent. Even though freshmen enrollment at selective colleges and universities increased by 9 percent, total enrollment dropped by about 1 percent. Highly selective and less-than-selective schools had total enrollment increases of between 1 percent and 2 percent, while freshmen enrollment was up 5 percent and 11 percent, respectively.

Figure 3 also shows that colleges and universities at all selectivity levels had some success in increasing their numbers of low-income undergraduates. At selective and highly

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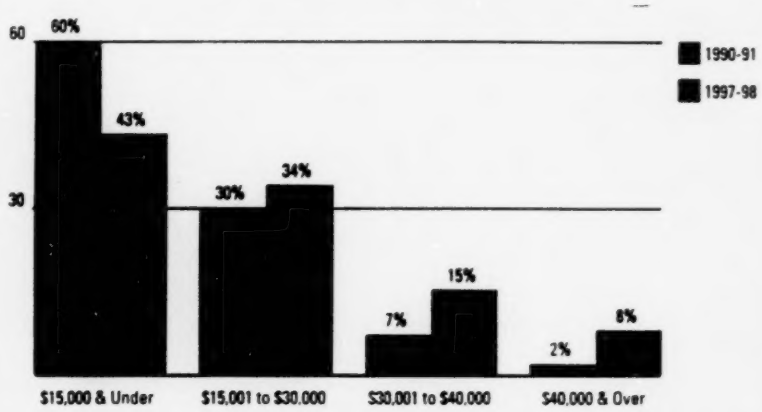
selective institutions, the number of Pell Grant recipients grew by 25 percent and 30 percent, respectively, while the number of those who received Pell Grants was up 20 percent at less selective colleges and universities. In spite of these large increases at selective and highly selective institutions, Pell Grant recipients are still over-represented at less selective colleges and universities. In 1997-98, nearly three quarters of those who got Pell Grants to attend private colleges and universities were enrolled at less-than-selective institutions. The percentage of undergraduates who received Pell Grants at highly selective institutions grew only slightly, rising from about 9 percent to 12 percent. At selective colleges and universities, the proportion of students who received Pell Grants grew from 14 percent to 18 percent, and the share of undergraduates at less selective institutions who got Pell Grants increased from 21 percent to 24 percent.

In addition, the income levels of Pell Grant awardees changed during the period. In 1990-91, 60 percent of Pell Grants recipients came from families with incomes of $15,000 or less. By 1997-98, the proportion of recipients from this income group declined to just 43 percent (see Figure 4). In the same period, the share of recipients from families with incomes of more than $30,000 grew from 9 percent to 23 percent. As a result, the median family income of Pell Grant recipients jumped by almost 59 percent — from $11,386 to $18,088 (U.S. Department of Education 1991b and 1998b). Several factors might account for this increase. The rising costs of college very likely made it possible for more students from relatively higher-income families to become eligible for Pell Grants. Further, Gladieux and Swail (1999) show that throughout the 1990s students from families with the lowest incomes were the least likely to attend postsecondary education. In 1996, just 54 percent of high school graduates from families in the lowest income quartile ($24,589 or less) were attending postsecondary education, compared with 85 percent of those from the highest income quartile ($71,802 and over). Still, throughout the study period, more than three quarters of the Pell Grant recipients came from families with incomes of $30,000 or less.

Figure 4. Family Income Levels of Pell Grant Recipients at Four-Year Private Colleges and Universities, 1990-91 and 1997-98



Source: U.S. Department of Education 1991b and 1998c.

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Tuition Discounting Compared With Net Tuition Revenue

Regardless of their goals for using tuition discounting, institutions have one standard that can be used to determine how their increases in grant spending affected their tuition and fee revenue: Was the marginal tuition and fee revenue generated by discounting greater than the marginal costs of providing this aid (Breneman 1994)? Or, put much more simply, were institutions able to increase their tuition revenue as a result of discounting? Were the increases in revenue greater than the costs of providing the discounts?

Marginal cost, marginal revenue, and net revenue figures were calculated to answer these questions. *Marginal cost* is simply the difference between the amounts provided for institutional grants in 1990-91 and 1996-97, while *marginal revenue* is the difference in gross tuition and fee funds collected by the institutions during the same period. *Net revenue* equals the difference between marginal revenue and marginal cost. All three figures were divided by full-time equivalent undergraduate enrollment to adjust for changes in numbers of students. The figures also were adjusted for inflation.

For at least one quarter of the four-year private institutions, discounting has resulted in a substantial loss in net tuition revenue.

At the very least, colleges and universities should ensure that net revenue is equal to zero, which would mean that their costs of discounting were no greater than the additional revenue they generated from having more students enroll on their campuses. Optimally, net tuition revenue should be greater than zero. If net revenue were greater than zero, then more funds would be available for educational and other programs on campus.

This is not to imply that institutions use discounting to "make a profit." On the contrary, these private colleges and universities are non-profit educational institutions that would be expected to use any additional funds to develop and expand academic and other programs that ultimately benefit students. But colleges and universities should not "lose" money because of discounting, for such losses could eventually harm academic programs and make it more difficult to provide quality education to their students.

At this point, a distinction should be made between a "paper" and a "real" loss in net tuition revenue that might result from discounting. Institutions with large endowments usually can fund their discounts with endowment earnings. Thus, if one were to compare tuition and fee revenue with increases in grants funded by tuition revenue exclusively, "on paper" these institutions might appear to have lost net revenue. In real terms, once funds from endowments were added, these institutions might have gains in net tuition revenue (or their losses would be much smaller). NACUBO's database includes discounts funded by both tuition revenue and endowment earnings, so any gains or losses in revenue are in "real" terms.

Based on the standards stated above, it appears that, for at least one quarter of the four-year private institutions, discounting has resulted in a substantial loss in net tuition revenue. As Table 3 demonstrates, at institutions with above-average increases in discount rates, marginal spending on institutional grants rose by $3,375 per FTE undergraduate. Conversely, marginal tuition and fee revenue increased by just $3,069. *The institutions with above average growth in tuition discount rates lost $306 per FTE as a result of their increases in spending on institutional grants.*

Another way to look at these figures is to divide the marginal increase in grant spending by the marginal increase in revenue, which would equal the percentage of marginal revenue

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used by institutions to cover their marginal increases in grants. The above-average institutions used 110 percent of their marginal increase in revenue to fund their increases in tuition discounting. In other words, *for each dollar these institutions gained in marginal tuition revenue, they provided $1.10 in tuition discounts.* Essentially, some undergraduates

Table 3. Marginal Increase in Institutional Grants, Marginal Increase in Tuition and Fee Revenue, and Net Tuition and Fee Revenue for Four-Year Private Colleges and Universities, by Level of Change in Tuition Discount Rates, 1990-91 and 1996-97

Percentage Point Change in Tuition Discount Rates	Number of Institutions	Marginal Increase in Institutional Grants per FTE	Marginal Increase in Tuition and Fee Revenue per FTE	Net Revenue (Marginal Rev. Minus Marginal Cost) Per FTE	Percent of Marginal Rev. Used for Added Grants
Below Avg (2.5 Points or Less)	66	$ 637	$3,481	$2,844	18.3%
Avg (2.5 to 13.1 Points)	134	1,640	2,987	1,347	54.9%
Above Avg (13.1 Points or More)	**66**	**3,375**	**3,069**	**-306**	**110.0%**
Total	266	$1,835	$3,105	$1,270	59.1%

Table 4. Marginal Increase in Institutional Grants, Tuition and Fee Revenue, and Net Tuition and Fee Revenue for Selective* Four-Year Private Colleges, by Level of Change in Tuition Discount Rates, 1990-91 and 1996-97

Percentage Point Change in Tuition Discount Rates	Number of Institutions	Marginal Increase in Institutional Grants per FTE	Marginal Increase in Tuition and Fee Revenue per FTE	Net Revenue (Marginal Rev. Minus Marginal Cost) Per FTE	Percent of Marginal Rev. Used for Added Grants
Below Avg (2.1 Points or Less)	17	$ 800	$4,981	$4,181	16.1%
Avg (2.1 to 10.9 Points)	33	1,523	2,954	1,431	51.6%
Above Avg (10.9 Points or More)	**17**	**3,595**	**2,762**	**-833**	**130.2%**
Total	67	$1,922	$3,340	$1,418	57.5%

*Includes highly selective and selective four-year private colleges and universities.
Source: National Association of College and University Business Officers 2000; Research Associates of Washington 1999.

were actually paying "negative tuition." The amounts some students received in discounts were greater than their institutions' listed tuition and fee prices (Winston and Zimmerman 2000). Institutions that lost net tuition revenue may have been able to make up for some of these losses through increased dollars from other sources (for example, from room and board charges). However, given the great dependency on tuition and fee funds at many private institutions, it is unlikely that any gains in funds from other sources were large enough to offset the losses in tuition revenue completely.

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The results were very different for institutions with below-average changes in discount rates. These institutions gained $3,481 per FTE in marginal revenue, while marginal costs rose by just $637, for a net gain of $2,844 per FTE. Each dollar of increased tuition revenue "cost" these institutions just 18 cents in added tuition discounts. For all institutions, net revenue increased $1,270 per FTE, or by 41 percent. *Each dollar gained in tuition and fee revenue "costs" the institutions 59 cents in added tuition discounts.*

Highly selective and selective colleges and universities[4] with above-average increases in discount rates had even greater losses in net revenue. Marginal grant spending at these schools jumped by $3,595 per FTE, but marginal revenue grew by only $2,762, for a loss of $833 per FTE (see Table 4 on the previous page). *For each dollar these institutions gained in marginal revenue, they provided $1.30 in additional tuition discounts.* This compares

Table 5. Change in Institutional Grants, Tuition and Fee Revenue, and Net Tuition and Fee Revenue at Less-Than-Selective Four-Year Private Colleges and Universities, by Level of Change in Tuition Discount Rages, 1990-91 and 1996-97

Percentage Point Change in Tuition Discount Rates	Number of Institutions	Marginal Increase in Institutional Grants per FTE	Marginal Increase in Tuition and Fee Revenue per FTE	Net Revenue (Marginal Rev. Minus Marginal Cost) Per FTE	Percent of Marginal Rev. Used for Added Grants
Below Avg (2.6 Points or Less)	48	$ 525	$2,776	$2,251	18.9%
Avg (2.6 to 13.6 Points)	97	1,685	2,954	1,269	57.0%
Above Avg (13.6 Points or More)	**48**	**3,291**	**3,289**	**-2**	**100.1%**
Total	193	$1,819	$2,960	$1,141	61.5%

Source: National Association of College and University Business Officers 2000; Research Associates of Washington 1999.

with a gain in net revenue of $4,181 per full-time equivalent undergraduate (or 84 percent) for selective institutions with below-average growth in discount rates. On average, selective institutions gained $1,418 per FTE (43 percent) in net revenue. Thus, about 57 percent of the growth in marginal revenue was used to fund the marginal increase in grants.

Added tuition revenue at less selective colleges and universities with above-average increases in discount rates barely kept pace with their growth in grant spending. These institutions had a $3,289 per FTE increase in marginal tuition revenue, but grant spending grew by $3,291 per FTE, for a lost of $2 per FTE undergraduate. Meanwhile, colleges and universities with below-average growth in discount rates had a net revenue gain of $2,251 per full-time equivalent student. On average, the less selective colleges and universities had a gain in net revenue of $1,141 per FTE undergraduate, a 39 percent increase in net revenue. *These figures mean that 61 percent of the growth in marginal revenue was used to fund the increased spending on tuition discounts.* Table 5 displays these results.

[4] Due to the small numbers of these colleges and universities, the selective and highly selective institutions were combined for this analysis.

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Ironically, the colleges and universities with above-average increases in discount rates were the most dependent on tuition and fee revenue to finance their basic educational operations. In 1995-96, institutions that increased discounting by above-average rates received nearly two-thirds of their educational and general revenue from tuition and fees. Tuition and fee dollars accounted for just 45 percent of the education-related funds at

Table 6. Percentage Change in Amounts Spent on Instruction, Plant Maintenance, and Academic Support at Four-Year Private Colleges and Universities, 1990-91 to 1995-96

	Instruction		
	Amount Spent in 1990-91 (in $1,000s)*	Amount Spent in 1995-96 (in $1,000s)	Percentage Change
Below Avg (Less than 2.5 Points)	$1,293,110	$1,540,254	19.1%
Avg (Between 2.5 and 13.1 Points)	2,774,316	3,089,957	11.4%
Above Avg (13.1 Points or More)	**984,469**	**1,015,998**	**3.2%**
All Institutions**	$1,065,480	$1,149,140	7.9%

	Plant Maintenance and Operations		
	Amount Spent in 1990-91 (in $1,000s)*	Amount Spent in 1995-96 (in $1,000s)	Percentage Change
Below Avg (Less than 2.5 Points)	$ 269,832	$ 288,572	6.9%
Avg (Between 2.5 and 13.1 Points)	614,346	656,061	6.8%
Above Avg (13.1 Points or More)	**232,197**	**230,392**	**-0.8%**
All Institutions**	$1,116,375	$1,175,025	5.3%

	Academic Support		
	Amount Spent in 1990-91 (in $1,000s)*	Amount Spent in 1995-96 (in $1,000s)	Percentage Change
Below Avg (Less than 2.5 Points)	$ 222,544	$ 244,066	9.7%
Avg (Between 2.5 and 13.1 Points)	625,820	675,997	8.0%
Above Avg (13.1 Points or More)	**217,116**	**229,077**	**5.5%**
All Institutions**	$1,065,480	$1,149,140	7.9%

*Data are in 1995-96 dollars.
**Expenditure data for three institutions were missing.

Source: National Association of College and University Business Officers 2000; Research Associates of Washington 1999; U.S. Department of Education 1990a and 1998a.

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colleges and universities with below-average growth in discount rates, and for 58 percent at those with average changes in rates (U.S. Department of Education 1998c).

It is no coincidence, then, that institutions that raised their tuition discounts by above-average rates also had the smallest increases in amounts spent to finance major academic-related campus operations. As Table 6 on the previous page shows, the funds that institutions with above-average growth in discounting devoted to instructional expenses increased by only 3 percent, compared with a 19 percent rise at below-average institutions. Expenditures for operation and maintenance of campus buildings and grounds fell by 1 percent at the colleges and universities with above-average growth rates in tuition discounting, but increased by about 7 percent at those with below-average and average rate increases. And the amounts devoted to academic support services (expenditures for libraries, museums, course and curriculum development, and other education-related services) grew by just 5 percent at the institutions with above-average growth in discounting, compared with 10 percent at colleges with below-average rate increases and 8 percent at those with average rates of change in discount rates.

It is quite likely that other factors were at work on the campuses with above-average increases in discounting that would account for these slower increases in education-related expenditures. But it seems clear that the large increases in institutional aid spending harmed these institutions' ability to increase funding for some important parts of their educational operations. These results are not meant to suggest that students' academic programs were compromised by these changes in spending patterns, but a number of institutions apparently struggled with their ability to provide larger increases in educational expenditures at the same time they expended greater amounts for tuition discounts.

Despite their substantial growth in grant spending, institutions with the largest increases in discounting saw the biggest declines in total undergraduate enrollments.

Tuition Discounting Compared with Total Enrollment and Pell Grant Recipients

espite their substantial growth in grant spending, institutions with the largest increases in discounting saw the biggest declines in total undergraduate enrollments. The number of undergraduates at colleges and universities with above-average increases in discount rates fell by 5 percent from 1990-91 to 1997-98 (see Figure 5 on the next page). In the same period, undergraduate enrollment grew by 7 percent at the institutions with below-average changes in discounting, and by 3 percent at institutions with average growth rates.

The decline in total enrollments at above-average institutions happened even though these institutions increased their enrollments of first-year undergraduates by 8 percent. However, the number of freshmen at institutions with average and below-average growth in discount rates grew by 11 percent. This finding shows that the large increases in institutional grants did not have a strong influence on first-year students' choices when they decided which private institutions to attend. Students weigh many factors outside of financial aid (choice of academic majors, quality of academic instruction and facilities, campus location, etc.) when they choose to enroll at a particular college or university (U.S. Department of Education 1998d). Increases in institutional grants are not a substitute for these other factors, and changes in discount rates by themselves cannot be expected to be the strongest influence in students' decisions to choose a college or university to attend.

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Selective institutions with above-average growth in discount rates experienced even sharper declines in undergraduate enrollments. Figure 6 displays these results. Selective and highly selective colleges and universities with above-average increases in discounting saw their numbers of undergraduates fall by 8 percent, compared with a drop of less than

Figure 5. Percentage Change in Total Undergraduate Enrollments and Enrollments of First-Time, Full-Time Freshmen at Four-Year Private Colleges and Universities, by Level of Change in Tuition Discount Rates, 1990-91 to 1997-98

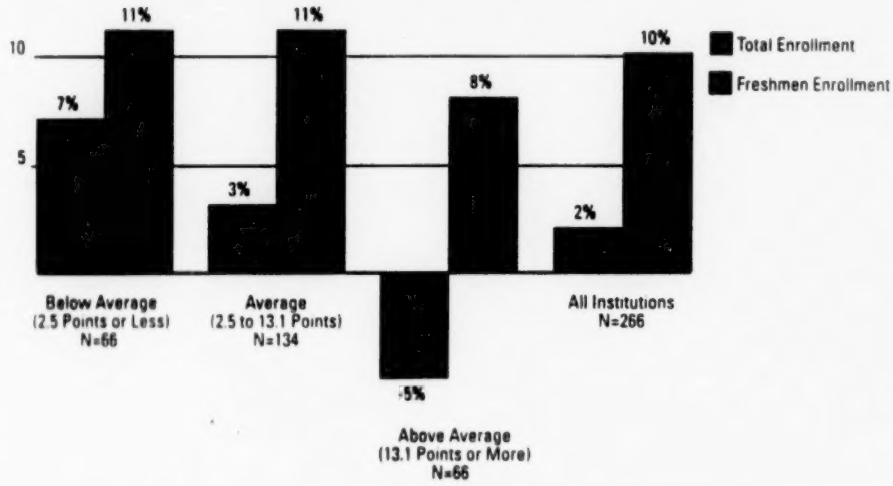
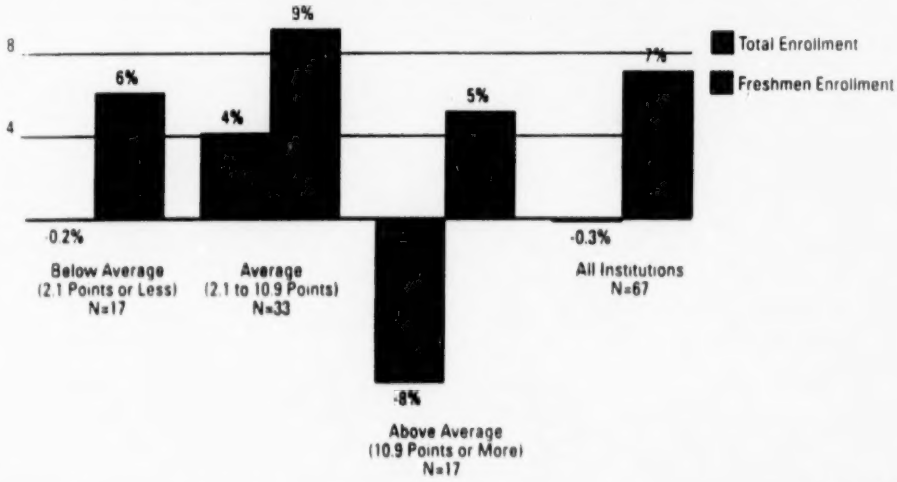


Figure 6. Change in Total Undergraduate Enrollment and Enrollment of First-Time, Full-Time Freshmen at Selective Institutions*, by Level of Change in Tuition Discount Rates, 1990-91 to 1997-98



* Includes highly selective and selective four-year private colleges and universities.
Source: National Association of College and University Business Officers 2000; U.S. Department of Education, 1998b and 1997a.

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1 percent at institutions with below-average changes in discount rates. The colleges and universities with above-average increases in discount rates also saw their numbers of first-time freshmen grow by only 5 percent, compared with increases of 9 percent at average institutions and 6 percent at below-average schools.

Figure 7. Percentage Change in Total Undergraduate Enrollment and Enrollment of First-Time, Full-Time Freshmen at Less-Than-Selective Institutions, by Level of Change in Tuition Discount Rates, 1990-91 to 1997-98

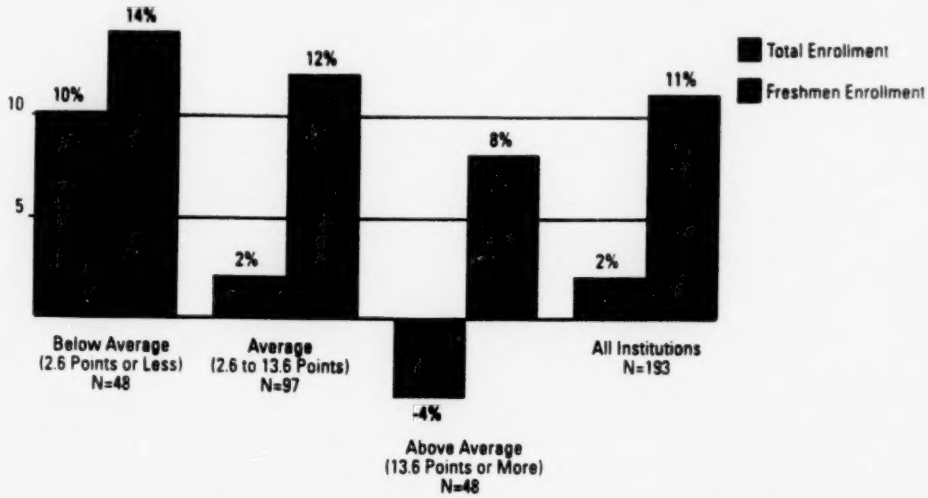
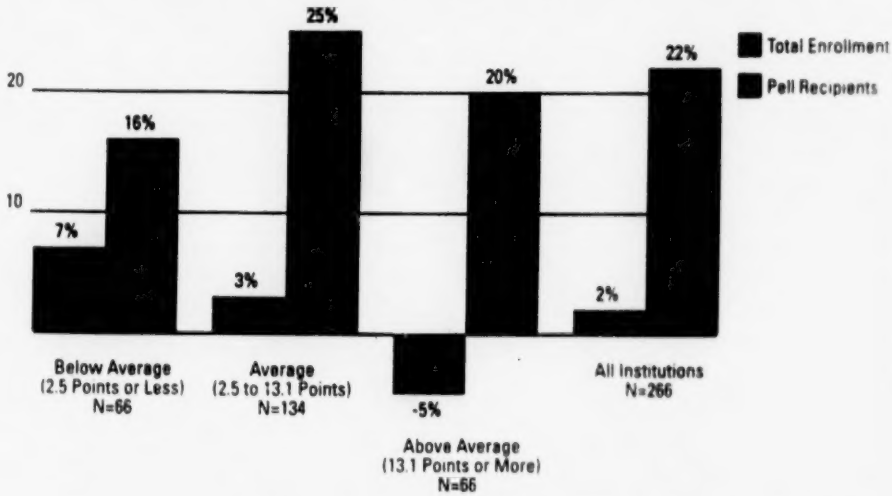


Figure 8. Percentage Change in Undergraduate Enrollments and Pell Grant Recipients at Four-Year Private Colleges and Universities, by Level of Change in Tuition Discount Rates, 1990-91 to 1997-98



Source: National Association of College and University Business Officers 2000; U.S. Department of Education, 1990b, 1991a, and 1997a, and 1998b.

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Results at less selective institutions were similar. Colleges and universities with above-average increases in discount rates saw their total enrollments fall by 4 percent, while enrollments jumped by 10 percent at below-average institutions and increased by 2 percent at average institutions (see Figure 7). Freshmen enrollments grew by 8 percent at above-average institutions, but increased by 14 percent and 12 percent at colleges and universities with below-average and average changes in discount rates, respectively.

However, as Figure 8 demonstrates, enrollments of low-income undergraduates were up sharply at all levels of change in tuition discount rates. For the colleges and universities with above-average gains in discounting, the number of Pell Grant recipients grew by 20 percent, which compares favorably with the 16 percent increase in low-income enrollments at institutions with below-average changes in discount rates. At schools with average increases in discounting, enrollments of Pell Grant recipients went up by 25 percent.

These results suggest that many colleges and universities, particularly those that had the highest increases in discount rates, were more successful at using their institutional grants to *attract* new first-year students to their campuses, but less successful in *retaining* these students toward graduation. That is, one reason total enrollment declined at institutions with the largest gains in discount rates is that a greater proportion of freshmen at these colleges and universities left before receiving their baccalaureate degrees. This situation may have caused total enrollments to fall despite the growth in numbers of first-year undergraduates.

Table 7. 1997 Graduation Rates* for Four-Year Private Colleges and Universities, by Undergraduate Admissions Selectivity and Level of Change in Tuition Discount Rates

	All Institutions	Highly Selective and Selective Institutions	Less-Than-Selective Institutions
Below Average	69.6%	85.3%	56.9%
Average	67.1%	82.7%	61.9%
Above Average	63.2%	71.4%	59.6%
All Institutions**	66.5%	80.2%	60.4%

*Based on the proportion of first-time, full-time, degree-seeking freshmen who received bachelor's degrees from their original higher education institutions by August 1997.

**Based on a sample of 187 four-year private colleges and universities that provided graduation rate data to the National Collegiate Athletic Association.

Source: National Collegiate Athletic Association 1998a and 1998b; National Association of College and University Business Officers 2000.

Table 7 illustrates this point by showing the six-year graduation rates for the colleges and universities that supplied data to the National Collegiate Athletic Association (NCAA 1998a and 1998b).[5] These data show the proportion of students who enrolled as degree-seeking, full-time, first-time freshmen in 1991-92, the first year the NCAA collected data, and received a bachelor's degree from their institutions within six years (by August 1997). At colleges and universities with the below-average increases in tuition discount rates, the average graduation rate was about 70 percent, versus 63 percent at above-average colleges and universities and 67 percent at institutions with average rates of increase in discounting. *These figures show that roughly 37 percent of the freshmen at institutions with above-average growth in discount rates left their colleges and*

[5] About 70 percent (187 of 266) of the colleges and universities in the NACUBO database supplied graduation rate data to the NCAA.

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universities before receiving a bachelor's degree, compared with 30 percent of those at below-average schools. A higher share of the undergraduates at institutions with above-average gains in discount rates transferred to another college or university, dropped below full-time enrollment, took longer to graduate, or left higher education entirely. It is also possible that some colleges that award large institutional grants to first-year students reduce aid amounts for students who return for the second and subsequent years of higher education; these lower grant amounts may cause some students to leave their institutions after the first year.

Administrators thus may need to emphasize both attracting and retaining undergraduates in order to achieve their revenue and enrollment goals.

At selective and highly selective institutions, the average graduation rate for colleges and universities with below-average changes in discount rates was about 85 percent, compared with 71 percent at colleges and universities with above-average changes. On the other hand, the 60 percent graduation rate at less selective institutions with above-average increases in discounting was slightly higher than the 57 percent average graduation rate at below-average colleges and universities.

While the differences in graduation rates are not substantial, they do suggest that a relationship exists between changes in discount rates, net revenue, and graduation rates, particularly at the more selective private colleges and universities. It is possible that total undergraduate enrollment and net tuition revenue fell at the colleges and universities with substantial increases in discount rates because these institutions had higher attrition rates, a problem that campus administrators cannot solve simply by raising their institutional aid budgets. Administrators thus may need to emphasize both *attracting* and *retaining* undergraduates in order to achieve their revenue and enrollment goals.

Tuition Discounting and Changes in SAT Scores of Admitted Freshmen

s mentioned, administrators at colleges and universities hope to use tuition discounting strategies to admit more students who demonstrate academic merit or other talents. Given the large increase in institutional grants to freshmen, it is possible that schools that raised their discount rates by above-average amounts were able to enroll more higher-ability students. Thus, these institutions may have achieved their goal of raising the academic "profiles" of their colleges and universities.

One way to compare changes in institutions' discount rates and their admission standards is to look at ' · trends in the median admissions test scores of admitted full-time, full-year underg tes, by selectivity level and level of change in discount rates. The most widely used a .ssions test is the Scholastic Aptitude Test (SAT), administered by the Educational Testing Service and the College Board. This test is often used to judge prospective students' academic merit and is seen as a predictor for students' chances of success at college-level academic study. Generally, the admissions test scores of admitted students is an indication of institutions' level of selectivity, with the students at the most-selective institutions having the highest average scores. A substantial change in these scores could be a strong indication of alterations in institutions' enrollment selection criteria. Median composite SAT score data (verbal and math scores combined) for admitted freshmen at the majority of private colleges and universities is collected by the College

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Board's *Annual Survey of Colleges* (College Board, 1992 and 1999c). These data were used to compare changes in median composite SAT scores for freshmen who enrolled in the fall of 1990[6] with those from the fall of 1997, by admissions selectivity level and level of change in tuition discount rates.

Some readers might object to the use of test scores in this way. At most four-year private colleges and universities, the SAT score is just one indicator that admissions officers use to evaluate the applications of prospective students. Others may argue that such comparisons are unfair to institutions that enroll large numbers of Pell Grant recipients, since students from higher-income families tend to do better on the SAT by virtue of their access to test-preparation courses (Chronicle of Higher Education 1999). Thus, institutions with larger numbers of Pell Grant recipients may have lower median SAT scores. Still others will point out that many other factors besides changes in tuition discount rates would account for changes in median SAT score levels of admitted students. For these reasons, the use of admissions scores in this study should be considered as an approximation of changes in institutions' selection criteria.

Based on the changes in median composite SAT scores, it appears that increases in tuition discount rates have not significantly affected institutions' ability to enroll students with higher SAT scores. In fact, both selective and less-than-selective institutions that had below-average increases in discount rates had the highest average increases in medi. SAT scores.

Table 8 (on the next page) demonstrates this point. At highly selective and selective colleges and universities, the median SAT score of admitted freshmen grew by nearly 10 percent at institutions with below-average increases in discount rates. At colleges and universities with average and above-average changes in discount rates, median SAT scores grew by less than 3 percent. The results are even more striking at less-selective private colleges. At average and below-average institutions, median SAT scores actually declined slightly, despite their sharp increases in amounts of institutional grants. Colleges and universities with below-average growth in discount rates had a small increase in median SAT scores.

Selective colleges and universities may have had some success in their efforts to use tuition discounts to recruit prospective undergraduates with academic merit. Average SAT scores for freshmen at these institutions did increase, but not by amounts large enough to make a substantial impact at most colleges. The results were just the opposite at less selective institutions. In fact, the small decline in SAT scores at less selective colleges and universities may suggest that more of these institutions were accepting more students regardless of their demonstrated academic ability in order to meet enrollment goals (Wolff and Bryant, 1999). However, these results should be judged cautiously, since none of the changes in SAT scores are statistically significant.[7] It is also possible that less-selective institutions purposefully gave more grants to low-income students without regard to their test scores in order to give these students greater access to higher education. The findings

It appears that increases in tuition discount rates have not significantly affected institutions ability to enroll students with higher SAT scores.

[6] In 1995, the College Board "re-centered" the SAT scoring scale to reflect changes in the test-taking population. The scores for fall 1990 used in this study are based on the "re-centered" scale. For more information, see the College Board's Web site, <http://www.collegeboard.org>.

[7] Statistical significance tests are based on Student's T calculation with a 5 percent margin for error.

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Table 8. Median Composite SAT Scores for Freshmen Who Entered Four-Year Private Colleges and Universities in Fall 1990 and Fall 1997, by Level of Change in Tuition Discount Rates

Selective and Highly Selective

Tuition Discounting Change Level	Median Composite SAT Score in Fall 1990*	Median Composite SAT Score In Fall 1997	Percentage Change
Below Average	1,187	1,302	9.7%
Average	1,245	1,280	2.8%
Above Average	1,182	1,210	2.3%
All Institutions	1,205	1,255	4.1%

Less-Than-Selective

Tuition Discounting Change Level	Median Composite SAT Score in Fall 1990*	Median Composite SAT Score In Fall 1997	Percentage Change
Below Average	1,062	1,070	0.8%
Average	1,125	1,095	-2.7%
Above Average	1,090	1,080	-0.9%
All Institutions	1,105	1,085	-1.8%

*SAT Scores for the Fall of 1990 were converted to the College Board's "re-centered" SAT scoring scale.

Source: College Board 1992 and 1999c; National Association of College and University Business Officers 2000.

therefore suggest, but cannot prove, that there is little or no relationship between colleges' increases in discount rates and their ability to recruit higher-ability first-year students.

The findings also suggest that some private institutions used a substantial portion of their need-based institutional grants to enroll an even larger number of low-income freshmen. In general, colleges appear to have been more successful at using their institutional grants to meet their educational equity goals, but were less successful in using tuition discounts to enroll more higher-ability undergraduates.

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Comparison of the NACUBO Sample with National Data

o account for any possible biases in the NACUBO sample, the study design was applied to the entire population of 1,463 four-year private colleges and universities that provided information to the U.S. Department of Education's IPEDS fall enrollment and finance surveys in 1989-90, 1995-96, and 1996-97 (U.S. Department of Education 1989, 1990a, 1998a, and 1998e), and Pell Grant data files for 1989-90 and 1996-97 (U.S. Department of Education 1990c and 1997b). By federal law,[8] all higher education institutions are required to complete the IPEDS surveys in order to remain eligible to participate in the programs authorized under Title IV of the Higher Education Act of 1965, as amended.[9] IPEDS thus provides a census that can be used to assess changes in enrollments and net tuition revenue at most of the accredited four-year private colleges and universities. Among many other items, the IPEDS finance survey collects the amounts institutions spend annually on institutional grants and scholarships and their gross tuition and fee revenue.

Several important distinctions between the IPEDS and NACUBO databases must be made before these results are shown. First, the most recent year of available finance data from IPEDS is 1995-96; as mentioned, the NACUBO data are more up-to-date. Second, the IPEDS data include amounts of institutional grants provided to graduate and professional students as well as undergraduates, while NACUBO's survey includes funds to undergraduates exclusively. While there is no way to know for sure how much of the aid reported by IPEDS was provided to advanced degree students, it is likely that the overwhelming majority of the funds went to undergraduates (Reindl and Redd 1999; Heller and Nelson Laird 1999). Similarly, the tuition and fee revenue and net tuition revenue data from IPEDS are based on tuition amounts paid by undergraduates and graduate/professional students. Third, the institutional aid figures reported in IPEDS may not include funds from endowment income, so these amounts may under-report the total amounts of aid provided to students. As such, these data also may underestimate the changes in net revenue. The IPEDS data do not report the proportion of aid provided to freshmen exclusively. Finally, some of the institutions in the IPEDS database did not report their amounts of institutional grant aid in both 1989-90 and 1995-96. For complete accuracy and comparability, institutions with missing data in either year were eliminated from the analysis, thus reducing the number of institutions included in this part of the study to 915.

The patterns and results for the IPEDS census reflect those reported for institutions in the NACUBO sample.

Despite these differences, the patterns and results for the IPEDS census reflect those reported for institutions in the NACUBO sample. Institutions with above-average increases in discount rates saw their net revenue decline by $70 per FTE undergraduate (see Table 9 on the next page). *For each dollar they gained in additional gross tuition and fee revenue, they provided almost $1.03 in tuition discounts.* This net revenue loss is lower than the amounts reported for the NACUBO sample, but the difference might be due to the inclusion of tuition revenue from graduate and professional students. Students in advanced

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[8] See 20 USC 1094(a)(17).

[9] Title IV of the Higher Education Act authorizes the Federal Pell Grant program and other programs that provide federal financial aid for students to attend postsecondary institutions.

degree programs usually are charged higher tuition and fee amounts than undergraduates (National Association of Student Financial Aid Administrators 1999), but are less likely to receive institutional grants. Thus, the inclusion of revenue from graduate/professional students might offset some of the losses in funds from discounts provided to undergraduates. If the IPEDS data counted the tuition discounts and revenue figures for undergraduates exclusively, the net revenue losses might have been even larger.

Table 9. Marginal Increase in Institutional Grants, Tuition and Fee Revenue, and Net Revenue for Four-Year Private Colleges and Universities, by Level of Change in Tuition Discount Rates, 1989-90 to 1995-96

Percentage Point Change in Tuition Discount Rates	Number of Institutions	Marginal Increase in Institutional Grants per FTE	Marginal Increase in Tuition and Fee Revenue per FTE	Net Revenue (Marginal Rev. Minus Marginal Cost) Per FTE	Percent of Marginal Rev. Used for Added Grants
Below Avg (1.6 Points or Less)	229	$ 162	$2,746	$2,584	5.9%
Avg (Between 1.6 to 10.3 Points)	457	1,461	3,142	1,681	46.5%
Above Avg (10.3 Points or More)	**229**	**2,761**	**2,691**	**-70**	**102.6%**
Total	915	$1,477	$3,000	$1,523	49.2%

Table 10. Marginal Increase in Institutional Grants, Tuition and Fee Revenue, and Net Revenue for Selective Four-Year Private Colleges and Universities, by Level of Change in Tuition Discount Rates, 1989-90 to 1995-96

Percentage Point Change in Tuition Discount Rates	Number of Institutions	Marginal Increase in Institutional Grants per FTE	Marginal Increase in Tuition and Fee Revenue per FTE	Net Revenue (Marginal Rev. Minus Marginal Cost) Per FTE	Percent of Marginal Rev. Used for Added Grants
Below Avg (1.6 Points or Less)	35	$1,342	$6,215	$4,873	21.6%
Avg (Between 1.6 to 10.3 Points)	71	2,429	4,563	2,134	53.2%
Above Avg (10.3 Points or More)	**35**	**3,938**	**3,815**	**-123**	**103.2%**
Total	141	$2,409	$5,110	$2,701	47.1%

Source: U.S. Department of Education 1990a and 1998a; Research Associates of Washington 1999.

The decline in net revenue was even greater for selective and highly selective colleges and universities with above-average increases in discount rates. Tables 10 and 11 display the losses in net tuition revenue for selective and less selective institutions, respectively. Selective colleges and universities with above-average growth in tuition discount rates lost $123 in net revenue per FTE, while less selective institutions with above-average increases in discount rates saw a loss of $39 per FTE undergraduate. Less-than-selective institutions with below-average changes in discount rates saw their grant spending per FTE student

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Table 11. Marginal Increase in Institutional Grants, Tuition and Fee Revenue, and Net Revenue for Less-Than-Selective Four-Year Private Colleges and Universities, by Level of Change in Tuition Discount Rates, 1989-90 to 1995-96

Percentage Point Change in Tuition Discount Rates	Number of Institutions	Marginal Increase in Institutional Grants per FTE	Marginal Increase in Tuition and Fee Revenue per FTE	Net Revenue (Marginal Rev. Minus Marginal Cost) Per FTE	Percent of Marginal Rev. Used for Added Grants
Below Avg (1.4 Points or Less)	189	$ (129)	$1,740	$1,869	NA
Avg (Between 1.4 to 10.5 Points)	377	1,166	2,678	1,512	43.5%
Above Avg (10.5 Points or More)	**189**	**2,482**	**2,443**	**-39**	**101.6%**
Total	755	$1,206	$2,409	$1,203	50.1%

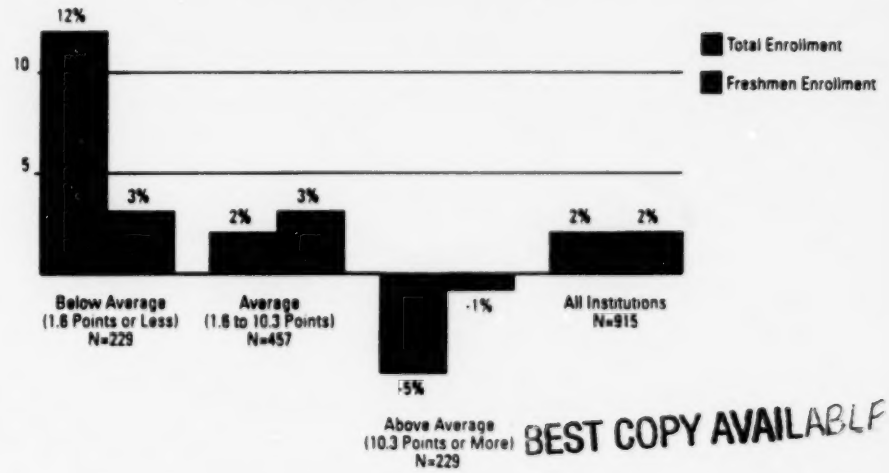
Source: U.S. Department of Education 1990a and 1998a; Research Associates of Washington 1999.

fall by $139, while spending by those with above-average increases in discount rates jumped by $2,482.

Like the NACUBO data, the IPEDS figures also show that the institutions with above-average increases in discount rates had the steepest declines in total undergraduate enrollment. Between fall 1989 and fall 1996, institutions with above-average increases in discounting saw their total number of undergraduates shrink by 5 percent. This decline compares with a 12 percent gain in the number of students at colleges and universities that changed their discount rates by below-average rates (see Figure 9). The number of first-time, full-time, degree-seeking freshmen at above-average institutions declined by 1 percent. By comparison, the number of first-year students rose by 3 percent at colleges and universities with below-average changes in discount rates.

Institutions at all discount rate change-levels in the IPEDS database had substantial growth in low-

Figure 9. Percentage Changes in Total Undergraduate Enrollments and Enrollments of First-Time, Full-Time Freshmen at Four-Year Private Colleges and Universities, 1989-90 to 1996-97



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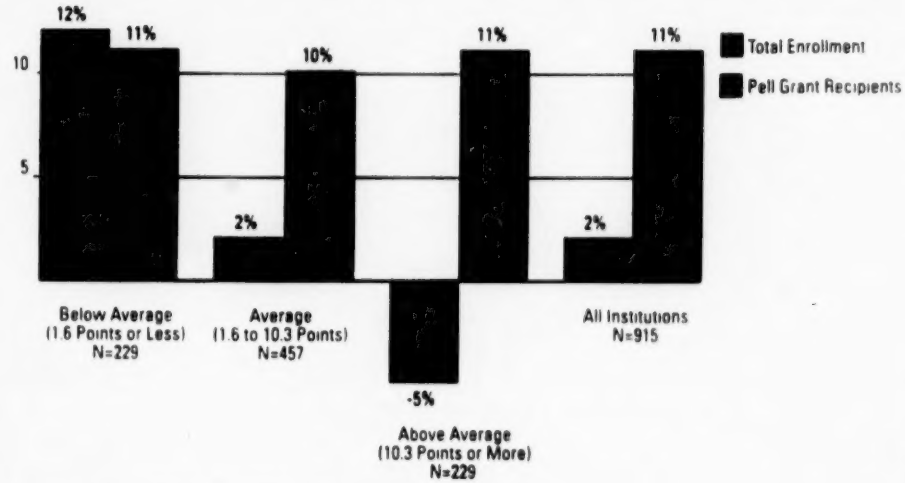
Source: U.S. Department of Education 1989 and 1998e.

income undergraduates. The number of Pell Grant recipients at colleges and universities with above-average gains in discount rates grew by 11 percent (see Figure 10). This growth was nearly the same as the increases in Pell Grant recipients at institutions with below-

Figure 10. Percentage Change in Total Undergraduate Enrollments and Pell Grant Recipients at Four-Year Private Colleges and Universities, 1989-90 to 1996-97



Source: U.S. Department of Education 1989, 1990c, 1997b, and 1998c.

average and average changes in discount rates. Both the NACUBO and IPEDS data show that four-year private colleges and universities were able to raise their enrollments of low-income students, but the price some institutions paid for this achievement was lower net tuition revenue and lower total undergraduate enrollments.

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Conclusion

It is clear that a large number of institutions used tuition discounting strategies that have led them down a precarious financial path. In just six years, at least one quarter of the four-year private colleges and universities increased their discount rates by 10 percentage points or more, and raised their spending on institutional grants by almost $3,400 per full-time equivalent undergraduate. These increases occurred at the same time that increases in gross tuition revenue were smaller, partly because of slower growth in tuition and fee prices. As a result, many institutions lost substantial amounts of net tuition revenue. Even some selective institutions lost more than $800 per FTE undergraduate in net revenue.

Obviously, losses of this magnitude cannot be sustained for long without affecting spending for other education-related expenditures. The institutions that lost net tuition revenue had lower increases in the funds they devoted to instruction and academic support services, and actually cut spending on maintenance of campus buildings and grounds. Large losses in net revenue appear to have made it more difficult for these institutions to fund these educational operations.

To make matters worse, the large increases in institutional grants to first-year students do not appear to have significantly affected the undergraduate enrollments at many private colleges and universities. In fact, the institutions with the largest increases in discount rates had the smallest increases in numbers of freshmen, and their total undergraduate enrollments fell by 5 percent. Selective colleges with above-average increases in discount rates saw their total enrollments shrink by 8 percent.

Increasing institutional grants also does not appear to have influenced substantially the academic characteristics of the undergraduate student bodies at most campuses. Despite large increases in the proportion of undergraduates who received merit scholarships and other non-need-based grants, even the most selective institutions saw the median SAT scores of their first-year students rise by less than 10 percent during the study period. These small increases suggest that the institutions' efforts to provide large non-need-based aid to students from upper-income families thus far have not substantially helped institutions raise their academic profiles or rankings in college guidebooks. Median SAT scores at less selective-institutions actually fell by about 2 percent. These institutions may have been more concerned with raising their total enrollments than with raising the academic profiles of their entering classes.

These negative trends may have occurred because, at many institutions, enrollment management goals have focused on increasing freshmen enrollment without also emphasizing *retention* of all undergraduates toward degree attainment. The colleges and universities with the highest increases in discount rates also had the lowest six-year graduation rates. Student retention might be a bigger problem for these institutions. If these colleges and universities had devoted more resources to services and programs that help retain students — and had slightly lower increases in tuition discounting — they might have increased enrollments, net revenue, and graduation rates.

However, tuition discounting does appear to have helped to increase the numbers of low-income undergraduates at four-year private colleges and universities. The number of Pell Grant recipients grew substantially at all selectivity levels, despite increases in tuition

Losses of this magnitude cannot be sustained for long without affecting spending for other education-related expenditures.

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prices. This strongly suggests that a large share of the institutional grant dollars are still being directed to low-income undergraduates. These funds appear to be providing educational opportunities for an increasing number of undergraduates from low- and moderate-income families.

Increasing tuition discounts appears to have made it possible for more undergraduates to enter higher education. Unfortunately, a number of colleges and universities have paid a steep price to reach this laudable goal. The rapid increases in discounting have resulted in losses in net revenue, have not improved retention or graduation rates, and have caused institutions to decrease spending on instruction and other vital services to students. Private colleges and universities will have to try other strategies before even more institutions follow a path heading toward disaster.

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